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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 09/813,415
Filing Date: March 21, 2001
Appellant(s): DILMAN ET AL.

_____
Eamon J. Wall
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/10/2008 appealing from the Office action

mailed 7/16/2008.

(1)   Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2)   Related Appeals and Interferences

A statement identifying the related appeals and interferences, which will directly

affect or be directly affected by or have a bearing on the decision in the pending

appeal, is contained in the brief.

(3)   Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4)   Status of Amendments

The statement of the status of the Amendment contained in the brief is correct.

(5)   Summary of claimed subject matter

The summary of the claimed subject matter is contained in the brief is correct.

(6)   Grounds of Rejection to be reviewed on appeal

The following ground(s) of rejection are applicable to the appealed claims:

(i) Claims 1, 6, 9 and 10 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Boukobza et al (U.S. 6,122,664) and Robinson et al (U.S.

6,570,867).

(ii) Claims 7, 8, 11, 12 and 14 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Maruyama et al (U.S. 6,857,025 B1) and Robinson et al

(U.S. 6,570,867).

This rejection is set forth in a prior office action, mailed on July 16, 2008.

(7)   ***Claims Appendix***

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8)   ***Evidence Relied Upon***

U.S. 6,122,664	Boukobza et al.	09-2000
U.S. 6,570,867 B1	Robinson et al	05-2003
U.S. 6,857,025 B1	Maruyama et al	02-2005

(9)   ***Grounds of Rejection***

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1, 6, 9 & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Boukobza et al (U.S. 6,122,664) and Robinson et al (U.S. 6,570,867).

3.   As per claims 1, 9 & 10 Boukobza disclosed a method for monitoring usage of

resources allocated to a plurality of nodes of a network comprising the steps of

assigning a parameter to each of the plurality of nodes of the network, wherein each

parameter is indicative of a rate of change of usage of said resources of the node,

locally monitoring at each of the nodes the rate of change of the usage of said

resources of the nodes; reporting to a centralized management station of the network

when the rate of change of the usage of the resources of one of the nodes exceeds a

first threshold (col.1, lines 33-35 & col.2, lines 21-55). However Boukobza did not

explicitly disclose initiating a poll of resources of nodes of the network by the centralized

management station in response to reporting from the node <u>or</u> a time interval being

exceeded; determining whether a sum of the currently reported rates of change of

usage of node resources, received in response to the poll initiated by the management

station, exceeds a second threshold; and generating an alarm if the sum of the currently

reported rates of change of usage of node resources exceeds the second threshold,

else updating the time interval.

In the same field of endeavor Robinson disclosed initiating a poll of resources of nodes

of the network by the centralized management station in response to reporting from the

node or a time interval being exceeded; determining whether a sum of the currently

reported rates of change of usage of node resources, received in response to the poll

initiated by the management station, exceeds a second threshold; and generating an

alarm if the sum of the currently reported rates of change of usage of node resources

exceeds the second threshold, else updating the time interval (col.2, lines 60-67, col.3, lines 1-12, col.5, lines 3-55, col.12, lines 26-44 & col.13, lines 46-58).

It would have been obvious to one in the ordinary skill in the art at the time the invention was made to have incorporated central management station initiating a poll of resources of at least one node in response to the reporting from the node disclosed by Robinson in a method of monitoring usage of resources in nodes of a network as disclosed by Boukobza in order to improve the management and monitoring of paths and routes available in a network resulting in a more stable and robust network for users.

4.   As per claim 6 Boukobza-Robinson disclosed the method of claim 1, further including the step of adjusting the usage of the resources in the node (Boukobza col.2, lines 21-38).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 7, 8, 11, 12 &14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama et al (U.S. 6,857,025 B1) and Robinson et al (U.S. 6,570,867).

7.   As per claim 7 Maruyama disclosed a method for monitoring usage of a resource

in nodes of a network (col.3, lines 52-67), comprising the steps of: (a) monitoring usage

of the resource in a node to determine when a rate of change of the usage exceeds a

first predetermined threshold: (b) reporting to a management station of the network

when the rate of change of the usage exceeds said first predetermined threshold (col.4,

lines 29-67, col.5, lines 1-35, col.8, lines 66-67 & col.9, lines 1-37). However Maruyama

did not explicitly disclose (c) initiating a poll of resources in the nodes of the network by

the management station in response to reporting from the node **or** a time interval being

exceeded. In the same field of endeavor Robinson disclosed (c) initiating a poll of

resources in the nodes of the network by the management station in response to

reporting from the node or a time interval being exceeded (col.2, lines 60-67, col.3, lines

1-12, col.5, lines 3-55, col.12, lines 26-44 & col.13, lines 46-58).

It would have been obvious to one in the ordinary skill in the art at the time the invention

was made to have incorporated initiating a poll of resources in the nodes of the network

by the management station in response to reporting from the node or a time interval

being exceeded disclosed by Robinson in a method of monitoring usage of resources in

nodes of a network as disclosed by Maruyama in order to improve the management and

monitoring of paths and routes available in a network resulting in a more stable and

robust network for users.

8.   As per claim 8 Maruyama disclosed a method of monitoring usage of resources

in nodes of a network, comprising the steps of: asynchronous reporting of an event to a

management station of the network of an event when a rate of change of a usage of at

least one resource of said resources in any of said node deviates from a prescribed

norm (col.3, lines 52-67, col.4, lines 29-67, col.5, lines 1-35, col.8, lines 66-67 & col.9,

lines 1-37). However Maruyama did not explicitly disclose periodic polling of the said

nodes in accordance with a polling interval, and a periodic polling of said nodes in

response to reporting of said event, wherein a tunable parameter is adjusted in

response to the usage. In the same field of endeavor Robinson disclosed periodic

polling of the said nodes in accordance with a polling interval, and a periodic polling of

said nodes in response to reporting of said event node (col.2, lines 60-67, col.3, lines 1-

12, col.5, lines 3-55, col.12, lines 26-44 & col.13, lines 46-58), wherein a tunable

parameter is adjusted in response to the usage (col.7, lines 59-64).

It would have been obvious to one in the ordinary skill in the art at the time the invention

was made to have incorporated central management station initiating a poll of resources

of at least one node in response to the reporting from the node disclosed by Robinson

in a method of monitoring usage of resources in nodes of a network as disclosed by

Maruyama in order to improve the management and monitoring of paths and routes

available in a network resulting in a more stable and robust network for users.

9.   As per claim 11 Maruyama-Robinson disclosed the method defined in claim 8

wherein said nodes are selected from the group consisting of routers, switches, bridges

and firewall devices (Robinson, col.5, lines 3-12).

10.   As per claim 12 Maruyama-Robinson disclosed the method defined in claim 8

wherein said nodes are selected from the group consisting of servers, hosts, and layer

4-7 switches (Maruyama, col.4, lines 29-44).

11.   As per claims 14 Maruyama-Robinson disclosed the method comprising: (e)

summing all the reported rate of change of the usage of the resources; and (e)

generating an alarm if the sum exceeds a second threshold, else updating a time

interval (Maruyama, col.4, lines 29-67 & col.5, lines 1-35).

 (10) Response to Arguments

With respect to claims 1, 6, 9 and 10 appellant argued on the following limitations

against the applied prior art Boukobza et al (U.S. 6,122,664) and Robinson et al (U.S.

6,570,867).

(A)   Claims 1, 6, 9 and 10.

(i) Claim 1:

Issue 1: Appellant on last paragraph of page 12 and first paragraph of page 13 and

page.19 of appeal brief argued that in claim 1 the combination of Boukobza and

Robinson fails to teach or suggest at least the feature of rate of change of usage of a

resource, thus, fails to disclose the claimed invention. Additionally on pages 13, 14, 15,

18 & 19 appellant again argued that Boukobza et al failed to disclose the monitoring of

the <u>rate of change</u> of usage of a resource as claimed in claim 1.

As to appellant's argument examiner would first like to point out Board's attention to the

following paragraph of page 9 in applicant's specification which describes "Rate of

Change".

> The second embodiment again has two components, namely the centralized
> monitoring process, a flow diagram for which is shown in Fig. 5, and the process
> 10   performed in the distributed nodes, a flow diagram for which is shown in Fig. 4 The Fig.
> 4 process performed in the nodes is fairly simple, and begins in step 401. In step 403, at
> each time t, a determination is made as to whether the rate of change of the monitored
> variable at any node exceeds a fixed amount δ If a NO result occurs, the process repeats
> step 403. However, if a YES result occurs, because $x_i(t) - x_i(i, t-1) > \delta$, then in step 405
> 15   the value $x_i(t)$ is sent to network management station 160.

In light of the broadest interpretation of the term "Rate of Change" used in the claim and

described in the above paragraph of applicant's disclosure examiner introduced

Boukobza et al. Boukobza discloses a management node that monitors plurality of

nodes in a network by distributing configured agents to the plurality of nodes which stay

resident in these nodes and monitor the node's parameter (Rate of Change) against a

pre-defined conditions or thresholds (∂). Please see Abstract below.

[57]   **ABSTRACT**

The present invention relates to a process for monitoring a
plurality of object types of a plurality of nodes (N1, N2, .
. , Nn) comprising a management node (MN) in an infor-
mation system. Monitoring is configured and then distrib-
uted in a filtered way from the management node (MN) to
autonomous agents (SAA), an autonomous agent being
installed in each node to be monitored in order, by providing
intertype correlation, either to locally process the different
object types or all of the objects of a domain called a global
object, defined generically, or to feed back information to be
displayed to the graphical interface of the management node,
each agent comprising a plurality of specific modules (SM1,
SM2, . . . , SMn) specific to the different object types or to
a particular domain, each specific module measuring static
and dynamic parameters particular to the object type it
monitors and collecting said measurements, testing condi-
tions on said parameters relative to predefined thresholds
and possibly triggering actions associated with said tested
conditions, which parameters, conditions and actions can be
modified by the user of the management node.

Boukobza on col.6, lines 3-20 as an example discloses agent being responsible for

monitoring the CPU utilization (A.K.A resource) rate of a node.

of a parameter or a condition). For each new parameter to be
measured, he describes the measurement command, indi-
5 cates whether or not he desires to have the measurement
displayed (in the form of a curve), specifies the conditions
which will trigger an action (a sequence of operations) The
action can consist of displaying the "down" status of an
10 object (an Oracle instance, for example) using a function
supplied by the product or of performing a test for correla-
tion with a piece of system information (cpu utilization rate,
for example) or Tuxedo information or information defined
by the user.
15
    Once the monitoring is configured, it can be activated.
The configuration cannot be modified during a monitoring,
and for this reason it is necessary to stop the monitoring first
in order to modify the configuration and then to restart the
20 monitoring in all of the agents.

Boukobza on col.6, lines 47-67 further elaborates on the monitoring of the <u>CPU</u>

<u>Utilization against a maximum threshold with respect to time</u>.

> The following is a non-limiting example of a configura-
> tion file specification which the administrator would be able
> to perform in order to describe objects he wishes to monitor,
> 50 to modify the predefined operation of the agent (and of
> specific modules) and/or to create new parameters and
> conditions.
>
> 55   ==>MAX_CPU percent of total cpu:
>
> indicates the maximum cpu time allocated for the autono-
> mous agent (generic agent and specific modules) in a node.
> If the maximum is reached, the modules modify the fre-
> 60 quency of the parameter measurement and/or give priority to
> certain operations.
>
>   ==>PERIOD seconds;
>
> 65 specifies the minimum time interval between two measure-
> ments of a parameter. This global value can be modified as
> necessary for a parameter or a condition.

Therefore in light of the above reasoning Boukobza clearly discloses the "rate of

change" of usage of a resource which is described as CPU Utilization in Boukobza's

disclosure.

Issue 2: Appellant on the last paragraph of page 15 argued that Boukobza fails to disclose "assigning a parameter to each of the plurality of nodes of the network, wherein each parameter is indicative of the <u>rate of change</u> of usage of said resources" as claimed in claim 1.

As to applicant's argument Boukobza clearly discloses the rate of change of usage of a resource in light of the explanation given above in issue 1.

Issue 3: Appellant on the third paragraph of page 16 argued that Robinson fails to disclose "assigning a parameter to each of the plurality of nodes of the network, wherein each parameter is indicative of the <u>rate of change</u> of usage of said resources" as claimed in claim 1.

As to applicant's argument examiner has cited Boukobza et al which anticipates "assigning a parameter to each of the plurality of nodes of the network, wherein each parameter is indicative of the <u>rate of change</u> of usage of said resources". Please see Issues 1 & 2 above.

Issue 4: On the last paragraph of page 19 of appeal brief Appellant argued that since claim 6 is dependent on claim 1 therefore it is also patentable based on the arguments presented for claim 1.

As to appellant's arguments since claim 1 is not patentable in light of the explanation given above. Therefore by virtue of its dependence claim 6 is also not patentable.

(ii) <u>Claim 9</u>

Issue 1: On third paragraph of page 20 and first paragraph of page 24 appellant argued that Boukobza nor Robinson in combination or alone fail to disclose "initiating a poll, by management station, of the node resource usage by the nodes of the network in response to a determination that <u>a sum of previously reported values indicative of node resource usage</u> received from the reporting nodes plus an upper bound of node resource usage for non-reporting nodes exceeds a threshold" as claimed in claim 9.

As to appellant's argument Boukobza clearly discloses that an offline analysis can also be done on the <u>previously recorded activities of the nodes</u> and can be shown as <u>Statistical reports</u>. It is well known that Statistical reports are formulated by summing all the data in a specific category over a period of time, which is the "resource usage" in our instant prior art on col.26, lines 51-67.

As for the offline analysis, the collection of the parameters occurs in a parameter file in each node monitored. The true conditions are recorded in a "trace" file in each node monitored. An offline analysis of this type is used for archive management over a determined period, for the display of past activities, for the statistical reports (over a day/week/month/year and various zooms on the information related to the "system/DB/TP/EpochBackup/etc.") Statistics can thus be established by Tuxedo application or for any application, by data base instance, by "machine/cluster", etc. The collection and analysis of information for verifying that the tuning ("tuning", SGA, etc.) is always correct. The offline analysis can also be performed by returning the files "param-log" and "actionlog" of each node "N_agent" to the node "N_admin". The offline analysis can also be carried out by importing the "trace" files of tools such as "DbaXpert" (Db*Activity, space monitor) or others.

Buoukobza has already disclosed determining resource usage by utilizing agents in plurality of nodes which stay resident in these nodes and monitor the node's parameters against pre-defined conditions or thresholds report it back to the management station. Please see Abstract below.

[57]   **ABSTRACT**

The present invention relates to a process for monitoring a
plurality of object types of a plurality of nodes (N1, N2, . ,
. , Nn) comprising a management node (MN) in an infor-
mation system. Monitoring is configured and then distrib-
uted in a filtered way from the management node (MN) to
autonomous agents (SAA), an autonomous agent being
installed in each node to be monitored in order, by providing
intertype correlation, either to locally process the different
object types or all of the objects of a domain called a global
object, defined generically, or to feed back information to be
displayed to the graphical interface of the management node,
each agent comprising a plurality of specific modules (SM1,
SM2, . . . , SMn) specific to the different object types or to
a particular domain, each specific module measuring static
and dynamic parameters particular to the object type it
monitors and collecting said measurements, testing condi-
tions on said parameters relative to predefined thresholds
and possibly triggering actions associated with said tested
conditions, which parameters, conditions and actions can be
modified by the user of the management node.

Therefore, Buoukobza clearly discloses "initiating a poll, by management station, of the

node resource usage by the nodes of the network in response to a determination that <u>a

sum of previously reported values indicative of node resource usage</u> received from the

reporting nodes plus an upper bound of node resource usage for non-reporting nodes

exceeds a threshold.

Issue 2: Applicant on page 21 with respect the limitation "initiating a poll, by

management station, of the node resource usage by the nodes of the network in

response to a determination that <u>a sum of previously reported values indicative of node

resource usage</u> received from the reporting nodes plus an upper bound of node

resource usage for non-reporting nodes exceeds a threshold" in claim 9, cited a

previous office action (5/2/2007) during the past prosecution of this application and

made arguments against a prior art (**Mendal** et al (U.S. 6,170,009) that **is not in**

question in this appeal brief.

The above argument is not applicable to his appeal brief because claim 9 was rejected

by prior arts Boukobza and Robinson on final office action dated 7/16/2008 prior to this

appeal brief. Examiner has already addressed this limitation through Boukobza et al in

Issue 1 for claim 9 above.

Issue 3: Appellant on pages 22 & 23 argued that Robinson fails to disclose "initiating a

poll, by management station, of the node resource usage by the nodes of the network in

response to a determination that <u>a sum of previously reported values indicative of node

resource usage</u> received from the reporting nodes plus an upper bound of node

resource usage for non-reporting nodes exceeds a threshold" as claimed in claim 9.

As to appellant argument examiner the above limitation is clearly disclosed in

Boukobza. Examiner has explained the reasoning regarding this argument in Issue 1

under claim 9 section of the Appeal brief above.

(iii) Claim 10:

Issue 1: Appellant on the third paragraph of page 25 argued that Boukobza and

Robinson, alone or in combination fail to teach or disclose "a variable time interval

comprising a difference between a current time and a time at which the node was last

polled by the management station".

As to appellant's argument Boukobza clearly discloses measuring a resource at variable

time interval on col.6, lines 47-67).

> The following is a non-limiting example of a configura-
> tion file specification which the administrator would be able
> to perform in order to describe objects he wishes to monitor,
> 50 to modify the predefined operation of the agent (and of
> specific modules) and/or to create new parameters and
> conditions.
>
> 55   ==>MAX_CPU percent of total cpu:
>
> indicates the maximum cpu time allocated for the autono-
> mous agent (generic agent and specific modules) in a node.
> If the maximum is reached, the modules modify the fre-
> 60 quency of the parameter measurement and/or give priority to
> certain operations.
>
>   ==>PERIOD seconds;
>
> 65 specifies the minimum time interval between two measure-
> ments of a parameter. This global value can be modified as
> necessary for a parameter or a condition.

Therefore the limitation "a variable time interval comprising a difference between a current time and a time at which the node was last polled by the management station is clearly anticipated in Boukobza.

Issue 2: Appellant on last paragraph of page 25 with respect to claim 10 argued that the combination of Boukobza and Robinson fails to teach or suggest at least the feature of <u>rate of change</u> of usage of a resource, thus, fails to disclose the claimed invention.

As to applicant's argument Boukobza clearly discloses the rate of <u>change of usage of a resource</u> in light of the explanation given above in Issue 1 under the claims 1, 6, 9 & 10 heading above..

(B)   Claims 7, 8, 11, 12 and 14.

(i) <u>Claims 7 & 14</u>

Issue 1: On second paragraph of page 27 appellant argued that the combination of Maruyama and Robinson fails to teach or suggest at least the feature <u>rate of change of usage of a resource</u> and thus fails to teach (a) monitoring of he resource at a node when rate of change of usage exceeds a first predetermined threshold and (b) reporting to the management station when rate of change of usage exceeds said first predetermined threshold" as claimed in claim 7.

As to appellant's argument examiner would first like to point out Board's attention to the

last paragraph of page.8 in applicant's specification which describes "Rate of Change".

        The second embodiment again has two components, namely the centralized

monitoring process, a flow diagram for which is shown in Fig. 5, and the process

10   performed in the distributed nodes, a flow diagram for which is shown in Fig. 4. The Fig.

4 process performed in the nodes is fairly simple, and begins in step 401. In step 403, at

each time t, a determination is made as to whether the rate of change of the monitored

variable at any node exceeds a fixed amount δ. If a NO result occurs, the process repeats

step 403. However, if a YES result occurs, because $x_i(t) - x(i, t-l) > \delta$, then in step 405

15   the value $x_i(t)$ is sent to network management station 160.

In light of the broadest interpretation of the term "Rate of Change" used in the claim and

described in the above paragraph of applicant's disclosure examiner introduced

Maruyama et al. Maruyama discloses implementing a Service Level Agreement (SLA)

on a plurality of nodes in network to regulate their bandwidth usage by monitoring the

traffic transfer rate in a node within a certain time cycle and comparing it a predefined

limit or threshold.

(57)   **ABSTRACT**

A highly scalable system and method for supporting (min, max) based Service Level Agreements (SLA) on outbound bandwidth usage for a plurality of customers whose applications (e.g.,Web sites) are hosted by a server farm that consists of a very large number of servers. The system employs a feedback system that enforces the outbound link bandwidth SLAs by regulating the inbound traffic to a server or server farm. Inbound traffic is admitted to servers using a rate denoted as $Rt(i,j)$, which is the amount of the ith customer's j^{th} type of traffic that can be admitted within a service cycle time to servers which support the ith customer. A centralized device computes $Rt(i,j)$ based on the history of admitted inbound traffic to servers, the history of generated outbound traffic from servers, and the SLAs of various customers. The $Rt(i,j)$ value is then relayed to one or more inbound traffic limiters that regulate the inbound traffic using the rates $Rt(i,j)$ in a given service cycle time. The process of computing and deploying $Rt(i,j)$ values is repeated periodically. In this manner, the system provides a method by which differentiated services can be provided to various types of traffic, the generation of output from a server or a server farm is avoided if that output cannot be delivered to end users, and revenue can be maximized when allocating bandwidth beyond the minimums.

In implementing the SLA with respect to bandwidth on a network node Maruyama discloses monitoring the traffic transfer rates (I.E. Rate of change of resource usage) with respect to a time cycle in a network node against the threshold defined in the SLA.

> FIG. 2 schematically illustrates an embodiment of the invention operating within the system environment shown in FIG. 1. A unit referred to herein as the inbound traffic scheduler (ITS) unit 20 is employed to observe the amount of incoming traffic 14 that consists of the amount of admitted inbound traffic and the amount of rejected traffic. The inbound traffic dispatching network 12 monitors both admitted and rejected traffic amount. The ITS unit 20 also observes outbound traffic 18. The ITS unit 20 then computes the expected amount of outbound traffic that would be generated when one unit of traffic is admitted to a server 16, computes the inbound traffic target rates, and informs the rates to an inbound traffic limiter (ITL) 22. The ITL 22 then regulates the arriving inbound traffic 14 by imposing target rates at which inbound traffic 14 is admitted. Each of these functions is performed for the ith customer's j^{th} class traffic within a service cycle time, which is a unit of time or period that is repeated. Optionally observed by the ITS unit 20 is the average resource usage $c(i,j)$ by a unit of type (i,j) inbound traffic 14.

Additionally, on col.6, lines 14-28 & Figure 2 Maruyama discloses monitoring resource

usage at the node to the management station.

> As also shown in FIG. 2, each server 16 may have a resource usage monitor (RUM) 26 that observes server resource usage, $c(i,j)$, and an outbound traffic monitor (OTM) 28 that observes the outbound traffic, $B(i,j)$, both of which are relayed to the ITS unit 20. There are a number of ways to observe the outbound traffic 18, $B(i,j)$, and any of which would be suitable for purposes of the present invention. The ITS unit 20 collects $Ra(i,j)$, $Rr(i,j)$, $B(i,j)$ and optionally $Rbound(i,j)$ and $c(i,j)$, and then computes the optimum values for $Rt(i,j)$ that meet the service level agreements (SLAs) and relays these values to one or more ITLs 22. As represented in FIG. 2, a server resource manager 21 is an optional means and its responsibility is to provide the absolute bound $Rbound(i,j)$ on the rate $Rt(i,j)$ regardless of the $Bmax(i,j)$ given in the (min,max) SLAs.

Therefore in light of the above explanation Maruyama clearly discloses the feature <u>rate</u>

<u>of change of usage</u> of a resource and (a) monitoring of the resource at a node when

rate of change of usage exceeds a first predetermined threshold and (b) reporting to the

management station when rate of change of usage exceeds said first predetermined

threshold" of claim 7.

Issue 2: Appellant on the second last paragraph of page 30 argued that Robinson failed

to disclose "rate of change of usage of resource" in claim 7.

As to appellant's argument examiner cited Maruyama not Robinson in the final office

action which anticipates "rate of change of usage of resource". Please see examiner's

explanation in Issue 1 above.

(ii) Claims 8, 11 & 12

Issue 1: Appellant on the second paragraph of page 32 argued that the combination of

Maruyama and Robinson fails to teach or suggest at least the feature rate of change of

usage of a resource and thus fails to teach "asynchronous reporting of an event to a

management station when rate of change of usage of at least on resource in any of the

nodes deviates from the prescribed norm".

As to appellant's argument examiner would first like to point out Board's attention to the

last paragraph of page.8 in applicant's specification which describes "Rate of Change".

The second embodiment again has two components, namely the centralized
monitoring process, a flow diagram for which is shown in Fig. 5, and the process

10   performed in the distributed nodes, a flow diagram for which is shown in Fig. 4 The Fig.
4 process performed in the nodes is fairly simple, and begins in step 401. In step 403, at
each time t, a determination is made as to whether the rate of change of the monitored
variable at any node exceeds a fixed amount δ If a NO result occurs, the process repeats
step 403. However, if a YES result occurs, because $x_i(t) - x(i, t-1) > \delta$, then in step 405

15   the value $x_i(t)$ is sent to network management station 160.

In light of the broadest interpretation of the term "Rate of Change" used in the claim and

described in the above paragraph of applicant's disclosure examiner introduced

Maruyama et al. Maruyama discloses implementing a Service Level Agreement (SLA)

on a plurality of nodes in network to regulate their bandwidth usage by monitoring the

traffic transfer rate in a node within a certain time cycle and comparing it a predefined

limit or threshold.

(57)   **ABSTRACT**

A highly scalable system and method for supporting (min, max) based Service Level Agreements (SLA) on outbound bandwidth usage for a plurality of customers whose applications (e.g.,Web sites) are hosted by a server farm that consists of a very large number of servers. The system employs a feedback system that enforces the outbound link bandwidth SLAs by regulating the inbound traffic to a server or server farm. Inbound traffic is admitted to servers using a rate denoted as $Rt(i,j)$, which is the amount of the ith customer's j^{th} type of traffic that can be admitted within a service cycle time to servers which support the ith customer. A centralized device computes $Rt(i,j)$ based on the history of admitted inbound traffic to servers, the history of generated outbound traffic from servers, and the SLAs of various customers. The $Rt(i,j)$ value is then relayed to one or more inbound traffic limiters that regulate the inbound traffic using the rates $Rt(i,j)$ in a given service cycle time. The process of computing and deploying $Rt(i,j)$ values is repeated periodically. In this manner, the system provides a method by which differentiated services can be provided to various types of traffic, the generation of output from a server or a server farm is avoided if that output cannot be delivered to end users, and revenue can be maximized when allocating bandwidth beyond the minimums.

In implementing the SLA with respect to bandwidth on a network node Maruyama

discloses monitoring the traffic transfer rates (I.E. Rate of change of resource usage)

with respect to a time cycle in a network node against the threshold defined in the SLA.

FIG. 2 schematically illustrates an embodiment of the invention operating within the system environment shown in FIG. 1. A unit referred to herein as the inbound traffic scheduler (ITS) unit 20 is employed to observe the amount 20 of incoming traffic 14 that consists of the amount of admitted inbound traffic and the amount of rejected traffic. The inbound traffic dispatching network 12 monitors both admitted and rejected traffic amount. The ITS unit 20 also observes outbound traffic 18. The ITS unit 20 then computes 25 the expected amount of outbound traffic that would be generated when one unit of traffic is admitted to a server 16, computes the inbound traffic target rates, and informs the rates to an inbound traffic limiter (ITL) 22. The ITL 22 then regulates the arriving inbound traffic 14 by imposing target 30 rates at which inbound traffic 14 is admitted. Each of these functions is performed for the ith customer's j^{th} class traffic within a service cycle time, which is a unit of time or period that is repeated. Optionally observed by the ITS unit 20 is the average resource usage $c(i,j)$ by a unit of type (i,j) 35 inbound traffic 14.

Additionally, on col.6, lines 14-28 & Figure 2 Maruyama discloses asynchronous reporting in which resource usage rate is monitored at the node and sent to the management station.

As also shown in FIG. 2, each server 16 may have a 15 resource usage monitor (RUM) 26 that observes server resource usage, $c(i,j)$, and an outbound traffic monitor (OTM) 28 that observes the outbound traffic, $B(i,j)$, both of which are relayed to the ITS unit 20. There are a number of ways to observe the outbound traffic 18, $B(i,j)$, and any of 20 which would be suitable for purposes of the present invention. The ITS unit 20 collects $Ra(i,j)$, $Rr(i,j)$, $B(i,j)$ and optionally $Rbound(i,j)$ and $c(i,j)$, and then computes the optimum values for $Rt(i,j)$ that meet the service level agreements (SLAs) and relays these values to one or more ITLs 25 22. As represented in FIG. 2, a server resource manager 21 is an optional means and its responsibility is to provide the absolute bound $Rbound (i,j)$ on the rate $Rt(i,j)$ regardless of the $Bmax(i,j)$ given in the (min,max) SLAs.

Therefore in light of the above explanation Maruyama clearly discloses the feature (1)

rate of change of usage.

For the (2) "Asynchronous aspect" (I.E Two way communication) of the claim limitation,

examiner cited Robinson.

Robinson on col.4, lines 58-67 described a centralized Network manager that manages

a plurality of nodes on a network.

> In the IP network **10**, the overall management of the IP
> network **10** of FIG. **1** is performed by a centralized network
> 60 management system which can be found in or attached to
> any one of the network nodes **11** shown in FIG. **1**. For
> clarity, the network management system will now be
> described below as being part of node **1** in reference to
> FIGS. 2 through 9 and as such, node **1** is hereinafter referred
> 65 to as the "network manager". However, it is to be understood
> that the network management system could alternatively be
> implemented in any other node **11** of the IP network **10** or

Robinson further disclosed (i) Network manager <u>requesting information</u> relating to

particular aspect of the node from a management agent resident on each of the nodes

which are responsible for monitoring the performance of the node such as packet

transfer rate during a given period of time, (ii) the <u>management agents in response of</u>

<u>the request</u> send the performance results back to the network manager (A.K.A

Asynchronous communication). Disclosed on col.5, lines 3-38 of Robinson cited below.

In the IP network 10 of FIG. 1, the network manager 1 is responsible for executing management applications such as the integrated network management (INM) application for monitoring and controlling network elements or NEs. Network elements are devices such as the edge nodes 12, network nodes 11 and their associated routers and interfaces. In order to be managed by the network manager 1, these network elements are each assigned to a management agent responsible for performing the network management functions requested by the network manager 1.

As is well known, the agents are responsible for accessing information about the network elements assigned to them and make it available to the network manager 1. For example, an agent might report the number of bytes and packets in and out of a particular network element, or the number of messages sent and received by that network element during a given time period. These variables are referred to as managed objects and are maintained in a database referred to as a management information base (MIB) unique to each network element. Therefore, when the network manager 1 requests information relating to a particular element of the IP network 10, that information is obtained from the associated MIB via the agent assigned to the particular network element. In the following description of the IP network 10, the MIBs and associated agents are not always referenced specifically. However, it is to be understood that by referring to the network elements, reference to the associated MIBs and agents is implied.

As noted above, the RPM system 20 of the IP network 10 is implemented to be operable in an SNMP environment. Although not essential to this invention, the SNMP implementation is highly desirable for promoting interoperability and facilitate the exchanges of management information between the network manager 1 and the agents of the respective network elements.

Therefore Robinson clearly anticipates the <u>Asynchronous communication aspect</u> of reporting an event on network node to the central management station.

Issue 2: Appellant on the fourth paragraph of page 33 argued that Maruyama fails to

teach or suggest "<u>Rate of change of traffic admission rate</u>" as claimed in claims 7.

As to appellants argument claims 7 does not describe "Rate of Change"

specifically as <u>"Rate of change of traffic admission rate"</u>. It rather describes it in

much broader way I.E "rate of change of a resource" hence it is not just limited to "rate

of change of traffic admission rate" as argued by the appellant. Therefore the above

argument with respect to the clamed limitation is incorrect. Examiner has already

addressed the argument that Maruyama discloses the "rate of change of a resource" in

Issue 1 above.

Issue 3:   Appellant on the last two lines of the fourth paragraph of page 33 again

argued that Maruyama fails to disclose or suggest "rate of change of usage of a

resource".

As to appellant's argument examiner as already addressed this argument in Issue 1

above which clearly explains that Maruyama discloses the "rate of change of usage of a

resource".

Issue 4: Appellant on the last paragraph of page 34 argued that Robinson fails to disclose the <u>rate of change of usage of a resource</u> as claimed in claim 8.

As to appellant's argument examiner cited Maruyama not Robinson in the final office action which anticipates "<u>rate of change of usage of resource</u>". Examiner has addressed this argument in Issue 1 under the heading claims 8, 11 & 12 above.

Issue 5: Appellant argued that since claims 11 and 12 depend directly from independent claim 8 therefore they are patentable for the same reasons given for claim 8.

As to appellant's argument since independent claim 8 is not allowable for the reasons provided above therefore claims 11 & 12 are also not patentable by virtue of their dependence claim 8.

Finally Examiner believes that the rejection based on prior art references is proper, sustainable that clearly anticipate applicant's invention as claimed and should be affirmed.

(11)   Related proceedings appendix

None.

Respectfully submitted,

/Asghar Bilgrami/

Examiner, Art Unit 2243

March 10, 2009

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